WHAT IS CLAIMED IS

1. A voltage controlled oscillator circuit particularly for a low power electronic device, the oscillator circuit including:

- a resonant circuit provided with at least one inductive element and a capacitive element whose capacitive value varies as a function of a control voltage applied across a capacitive element to adjust the frequency of two oscillating signals in phase opposition which are respectively supplied by a first and a second output terminals of the resonant circuit,

- at least one pair of cross-coupled transistors, which is connected to the resonant circuit to compensate for the resonant circuit losses, the transistors each including a control terminal and a first and second current terminals, the first current terminal of the first transistor or respectively of the second transistor being connected to the first output terminal or respectively the second output terminal of the resonant circuit, whereas the control terminal of each transistor is connected via a coupling capacitor to the first current terminal of the other transistor,

wherein each transistor of the pair is connected in parallel to a diode mounted transistor, through which a current, supplied by a current source passes, each transistor of the pair and the corresponding diode mounted transistor forming a current mirror to impose a mean current on the resonant circuit so as to supply oscillating signals at a maximum amplitude depending on the sizing of certain elements of said circuit.

2. An oscillator circuit according to claim 1, wherein it includes an oscillating signal amplitude regulation loop in which the current value of the current source of each current mirror varies as a function of the detected oscillating signal amplitude level, the current value decreasing or respectively increasing, when there is an increase or respectively a decrease in the oscillating signal amplitude level.

3. An oscillator according to claim 2, wherein the amplitude regulation loop includes in particular two resistors series connected between the control terminals of the transistors of the pair, and a filtering capacitor, whose first electrode is connected directly or via an arrangement of return transistors, to the connection node of the two resistors, and whose second electrode is connected to a high or low potential terminal of a voltage source, a common mode voltage level, which depends on the oscillating signal amplitude level, being picked up across the first electrode of the filtering capacitor via the connection node of the resistors, to determine the current value of the current sources.

4. An oscillator circuit according to claim 3, wherein the current value of the current sources in the amplitude regulation loop is defined by a reference resistor, which is connected to a current terminal of at least one reference transistor, a control terminal of the reference transistor being connected to the first electrode of the filtering capacitor so as to place the reference resistor and the reference transistor in parallel to the filtering capacitor, the reference transistor being biased by the common mode voltage picked up by the filtering capacitor.

5. An oscillator circuit according to claim 1, wherein the resonant circuit of the pair of cross-coupled transistors are arranged in series between a high potential terminal and a low potential terminal of a regulated voltage source, the second current terminal of each transistor of the pair and of the corresponding diode mounted transistor being directly connected to the high potential terminal or the low potential terminal of the regulated voltage source, and wherein the resonant circuit includes two inductive elements each connected to a respective output terminal of the resonant circuit and to the potential terminal opposite to the potential terminal connecting the second current terminal of the transistors, the variable capacitive element being connected between the two output terminals of the resonant circuit.

6. An oscillator circuit according to claim 5, wherein the pair of cross-coupled transistors, and each diode mounted transistor connected to a corresponding transistor of the pair, are NMOS type transistors, whose source is directly connected to a low potential terminal of a regulated voltage source, and wherein the reference transistor is an NMOS type transistor whose source is connected to the reference resistor, which is connected to a low potential terminal of a voltage source, and whose drain supplies a reference current to a diode mounted PMOS transistor of a second current mirror, which is connected to a high potential terminal of a supply voltage source, two other PMOS transistors of the second current mirror being connected in parallel to the diode mounted PMOS transistor so as to duplicate the reference current to each provide a current to the diode mounted NMOS transistors, the current value depending on the detected oscillating signal amplitude level.

7. An oscillator circuit according to claim 1, wherein it includes a first and second pairs of cross-coupled transistors of different types, the control terminal of each transistor of the two pairs being connected via a coupling capacitor to the first current terminal of the other transistor of the pair, and wherein the resonant circuit, which includes, between the two output terminals an inductive element in parallel to the capacitive element, is placed between the two pairs of transistors, the second current terminal of each transistor of the first pair being connected to a low potential

terminal, whereas the second current terminal of each transistor of the second pair is connected to a high potential terminal of a supply voltage source.

8. An oscillator circuit according to claim 7, wherein the first pair of cross-coupled transistors, and each diode mounted transistor connected to a corresponding transistor of the first pair, are PMOS type transistors, whose source is directly connected to a high potential terminal of the supply voltage source, and wherein the second pair of cross-coupled transistors are NMOS type transistors, whose source is directly connected to a low potential terminal of the voltage source.

9. An oscillator circuit according to claim 8, wherein it includes two parallel reference transistors, the reference transistors being NMOS transistors whose source is connected to the reference resistor, which is connected to a low potential terminal of a voltage source, and the drain of each reference transistor supplies a reference current to the respective diode mounted PMOS transistor, wherein the connection node of the two resistors series connected between the gates of the transistors of the first pair is connected to a gate of a return PMOS transistor, whose source is directly connected to the high potential terminal of the voltage source, and whose drain is connected to a diode mounted return NMOS transistor, the source of this NMOS transistor being directly connected to the low potential terminal of the voltage source, wherein the drain and the gate of the return NMOS transistor are connected to the first electrode of the filtering capacitor and to the gates of the reference transistors, and wherein two other resistors are series connected between the control terminals of the NMOS transistors of the second pair, the connection node of these resistors being connected to the first electrode of the filtering capacitor to be used to bias the NMOS transistors of the second pair.

10. An oscillator circuit according to claim 1, wherein each coupling capacitor of the control terminals of the transistors of each pair forms part of a capacitive divider per transistor of each pair, for dividing the voltage of the oscillating signals to be supplied across the control terminals of the transistors of each pair.